sheet manufacturer's certified analysis, sheet manufacturer's guarantee, and thickness determination and tolerance.

7.3.3. ***Fabrication.***

7.3.3.1. ***Shape, Dimensions, and Masses.*** The units, to the shape and dimensions and number of pieces as shown in the standard drawing or special details in the Plans for steel culvert end sections, shall be manufactured as integral units so they can be readily assembled and erected in place.

7.3.3.2. ***Bolts.*** Galvanized bolts may be used for assembly of end sections where more than one piece is used to form the skirt, when sections have not been riveted together.

7.3.3.3. ***Workmanship.*** It is the intent of these Specifications that in addition to compliance with the details of construction, the completed unit show carefully finished workmanship in all particulars. This requirement applies not only to the individual unit, but to the shipment as a whole.

The following defects are specified as constituting poor workmanship, and the presence of any of them in an individual unit in any shipment shall constitute sufficient cause for rejection: not of the specified dimensions, not of the specified shape, uneven laps, ragged sheared edge, loose, unevenly lined or spaced rivets, poorly formed rivet heads, illegible brands, lack of rigidity, or dents or bends in the metal itself.

7.3.4. ***Sampling and Testing.*** All steel culvert end sections will be inspected for compliance with the provisions governing fabrication heretofore given. Sample and test all sheet stock going into such end sections as provided in AASHTO M 36M and T 65.

SECTION 727
TIMBER AND LUMBER

This Subsection covers treated or untreated timber and lumber for use in the construction of timber bridges.

727.01 TIMBER AND LUBMER.

(a) **Species of Wood.** Timber and lumber furnished under these Specifications shall be Douglas Fir of the coast region only, or Southern Yellow Pine.

(b) **Grades.** The grades of timber and lumber covered herein are as follows:

Stress Grades:
1700 F
1600 F
1450 F
1200 F
1100 F

The particular stress grade governing shall be that specified on the Plans.

(c) **Classes.** The above named grades are further subdivided on the basis of use, size, and defects, into the following classes:

Joist and Plank: For stress grades 1700 F to 1100 F

Beams and Stringers: For stress grades 1700 F to 1450 F

(d) **Sizes.** Nominal sizes included in the two classes area are as follows:

Class	Nominal Thickness, inches (mm)	Nominal Width, inches (mm)
Joist and Plank	2 to 4 (50.8 to 101.6)	$4 ($101.6)
Beams and Stringers	$5($127)	$8 ($203.2)

(e) **Dressing.** Dressing shall be in accordance with Section 507 or as modified on the Plans.

(f) **Size Standards.** When surfaced S1E and S1S to S4S, timber shall not be smaller in any dimensions affected by surfacing than the nominal dimensions less 1/2 inch (12.7 mm) for dimensions of 7 inches (178 mm) or less and 3/4 inch (19.1 mm) for dimensions of 8 inches (203.2 mm) and greater.

Rough timber shall be sawn full to nominal dimensions except that the following occasional variation in sawing is permissible:

	Permissible Variations	
Nominal Size, inches (mm)	**Under, inches (mm)**	**Over, inches (mm)**
2 to 7 (50.8 to 177.8)	1/16 (1.6)	1/4 (6.4)
$8($203.2 mm)	1/8 (3.2)	1/2 (12.7)

No shipment shall contain more than 20 percent of pieces of minimum dimension due to such variation in sawing.

(g) **Grading Requirements.** Methods of grading and general requirements shall be in accordance with the Southern Pine Inspection Bureau (SPIB) for Southern Pine and the West Coast Lumber Inspection Bureau (WCLIB) for Douglas Fir, grading rules, latest editions.

(h) **Inspection.** If untreated, the timber shall be inspected at destination; if treated, it shall be inspected at the treating plant.

NOTE: No allowance shall be made for shrinkage or variation in manufacture other than outlined in these Specifications.

SECTION 728
TIMBER PILES

728.01. TIMBER PILES.

(a) **Materials Covered.** This Section covers requirements for round timber piles to be used untreated, or treated by standard preservatives, as specified; timber piles shall meet the requirements of AASHTO M168, except as modified by these Specifications.

The diameter of the pile shall be determined by means of a circumference-diameter tape, and in the case of piles to be treated, such measurements shall be taken at the treating plant immediately prior to treatment, or in the case of untreated piles, it shall be measured on the job.

Piles after peeling shall have the minimum dimensions of the tip and at a section 4 feet (1.2 m) from the butt as shown in the following tabulations: